

LEGISLATIVE REPORT

DEMOGRAPHICS ON NON- INDUSTRIAL PRIVATE FORESTS AND WOODLANDS

SUBMITTED BY:

THE SMALL FOREST LANDOWNER OFFICE

OF THE DEPARTMENT OF NATURAL

RESOURCES

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Table of Contents

Index to Tables and Figures	2
Introduction.....	3
Prologue	4
Washington State Small Forest Landowner Demographics	5
Answers to Legislative Questions.....	5
<i>Landholdings</i>	5
<i>Contiguous Ownerships / Residency</i>	7
<i>Watershed Administrative Units</i>	8
<i>Trends in Forest Practices Applications</i>	9
<i>Recommendations for More Effective Incentives</i>	10
<i>Forestry Riparian Easement Program</i>	10
<i>Alternate Plans</i>	10
<i>Small Forest Landowner Database</i>	11
<i>Educational Outreach</i>	11
<i>Grant funds manager</i>	11
<i>Programmatic Habitat Conservation Plan for Family Forests</i>	12
<i>Small Forestry Business Development</i>	12
Appendix A.....	13
Comparison of Geographic Information System (GIS) data and tabular tax parcel data when trying to answer spatially explicit questions.	13
Appendix B	14
Statewide small forest ownerships by watershed administrative unit (WAU).....	14
Appendix C	16
Non-industrial private forestlands by watershed administrative unit (WAU) in Clark and King County	16
Appendix D	18
Percent of riparian land base in non-industrial private forest ownerships by watershed in Clark and King County.....	18

Index to Tables and Figures

Table 1. Total amount of non-industrial private forests and woodlands in forest-use tax classifications per landholding size class in Eastern and Western WA according to statewide county tabular tax parcel databases.....	6
Table 2. Number of persons having total non-industrial private forest and woodland holdings in forest-use tax classifications in Eastern and Western WA according to statewide county tabular tax parcel databases.....	6
Table 3. Clark County tabular tax parcel database residence information for forested parcels less than 20 acres.....	8
Table 4. King County GIS assessed improvement value information for parcels 5-20 acres in size.	8
Figure 1. A comparison of non-industrial private forestland statistics using geographic information system tax parcel record methods versus tabular tax parcel record methods.....	13
Table 5. Statewide non-industrial private forest ownerships by watershed administrative unit.....	14
Table 6. Non-industrial private forestlands by WAU in Clark County. WAUs that are not listed have no non-industrial private forest riparian ownership.	16
Table 7. Non-industrial private forestland by WAU in King County. Those WAUs that are not listed have no non-industrial private forest riparian ownership.....	16
Table 8. Percent of riparian land base (100 ft. buffer) in non-industrial private forest ownerships by WAU using Clark County GIS data. WAUs that are not listed have no non-industrial private forest riparian ownerships.....	18
Table 9. Percent of riparian land base (100 ft. buffer) in non-industrial private forest ownerships by WAU using King County GIS data. Those WAUs that are not listed have no non-industrial private forest riparian ownerships.....	18

Introduction

The Small Forest Landowner Office Legislative Report is being submitted as required by legislation (see RCW 76.13.110). This report answers questions asked by the state legislature regarding demographics on non-industrial private forest and woodland ownerships and recommendations for improving the economic and ecological viability of small forestlands.

This report was prepared by the Small Forest Landowner Office staff and reviewed by the Small Forest Landowner Office Advisory Committee. It is being sent on behalf of the Department of Natural Resources. The Small Forest Landowner Office was established to provide assistance to small forest landowners as they implement the new Forests and Fish rules. The Office administers the Forestry Riparian Easement Program, provides assistance to small forest landowners in the alternate planning process, conducts public outreach and develops educational materials and is researching innovative policies for improving forest management on small woodlots across the state.

Additional information on the methods used to develop this report and a series of appendixes with supporting data are available from the Small Forest Landowner Office website at <http://www.dnr.wa.gov/sflo/>.

Staff from the Small Forest Landowner Office are available to provide in-person reports on any aspect of this report. For more information regarding the Office or this report, please contact Steve Stinson at 902-1404, e-mail steve.stinson@wadnr, or Kirk Hanson at 902-1391, e-mail kirk.hanson@wadnr.gov.

Prologue

In response to the legislative request for a report on small forest landowner demographics, the Small Forest Landowner Office (Office) embarked on the first effort in Washington State to systematically collect comprehensive and detailed statewide demographics on all small forest landowners and the land base they manage¹.

The Office began developing this database by first collecting tabular (non-digital) tax parcel records from each of the 35 timbered counties in the state. Each county has special tax classifications for lands that are managed as forests. These classifications apply to any parcel of land that is greater than five acres in size. Counties do not have forest land information for parcels less than 5 acres in size. Therefore, the small forest landowner database quantified the number of landowners statewide who owned forested parcels ranging from 5 to 5,000 acres that were enrolled in a forest use tax classification.

The information provided in this report is based largely on the county tabular tax parcel record. Although tabular information has spatial references, it is based on legal descriptions (township, range, and section), and therefore has a resolution of usually one mile. County tabular tax parcel records provide too coarse of resolution data to show proximal locations to water types, accurate estimations of ownerships within watersheds or patterns of contiguous ownerships. As a result, answering the questions for this report with a high degree of certainty was very difficult. Having a more powerful analytical tool such as a statewide Geographic Information System (GIS) database of small forestlands that can provide spatially explicit, high resolution geographic data on this land base would go along way toward providing the necessary information for compiling this report. With few exceptions, this kind of GIS information is currently not available. As a result, several of the questions posed by the state legislature could not be answered in their entirety due to the limitations of tabular tax parcel data.

[Appendix A](#) shows a comparison between the uses of tabular data versus sampled GIS data when trying to conduct analysis of geographic information.

¹ For an overview of the data collection process conducted for the purposes of this report, please contact the Small Forest Landowner Office.

Washington State Small Forest Landowner Demographics

The Salmon Recovery Act 1999 LAWS SP. SESS. CH. 4, codified into law as RCW 76.13.110, outlines the provisions under which the department of natural resources shall establish and maintain a Small Forest Landowner Office and provides statutory direction for the Office. RCW 76.13.110 subsections (5)(a) through (5)(d) direct the Small Forest Landowner Office to collect demographic information on small forest landowners and provide, “a report to the board and the legislature containing:

- (a) Estimates of the amounts of non-industrial forests and woodlands in holdings of twenty acres or less, twenty-one to one hundred acres, one hundred to one thousand acres, and one thousand to five thousand acres, in western Washington and eastern Washington, and the number of persons having total non-industrial forest and woodland holdings in those size ranges;*
- (b) Estimates of the number of parcels of non-industrial forests and woodlands held in contiguous ownerships of twenty acres or less, and the percentages of those parcels containing improvements used: (i) As primary residences for half or more of most years; (ii) as vacation homes or other temporary residences for less than half of most years; and (iii) for other uses;*
- (c) The watershed administrative units in which significant portions of the riparian areas or total land area are non-industrial forests and woodlands;*
- (d) Estimates of the number of forest practices applications and notifications filed per year for forest road construction, silvicultural activities to enhance timber growth, timber harvest not associated with conversion to non-forest land uses, with estimates of the number of acres of non-industrial forests and woodlands on which forest practices are conducted under those applications and notifications.*
- (e) Recommendations on ways the board and the legislature could provide more effective incentives to encourage continued management of non-industrial forests and woodlands for forestry uses in ways that better protect salmon, other fish and wildlife, water quality, and other environmental values.*

Answers to Legislative Questions

Landholdings

Question:

[Provide] estimates of the amounts of non-industrial forests and woodlands in holdings of twenty acres or less, twenty-one to one hundred acres, one hundred to one thousand acres, and one thousand to five thousand acres, in western Washington and eastern Washington, and the number of persons having total non-industrial forest and woodland holdings in those size ranges.

Results of Tabular Tax Parcel Information

Table 1. Total amount of non-industrial private forests and woodlands in forest-use tax classifications per landholding size class in Eastern and Western WA according to statewide county tabular tax parcel databases. Data on forest land ownerships less than 5 acres is not currently available.

Landholding Size class	Total acres in Western WA	Total acres in Eastern WA
5-20 acres	104,486	31,487
21-100 acres	450,591	424,877
101-1,000 acres	200,224	396,888
1,001-5,000 acres	0	0
Totals	755,301	853,252
Total acres statewide: 1,608,553		

Table 2. Number of persons having total non-industrial private forest and woodland holdings in forest-use tax classifications in Eastern and Western WA according to statewide county tabular tax parcel databases.

Total landholdings statewide	Total landowners in Western WA	Total landowners in Eastern WA
5-20 acres	4,853	1,744
21-100 acres	6,429	5,061
101-1,000 acres	1,470	1,970
1,001-5,000 acres	56	75
Totals	12,808	8,850
Total Landowners Statewide: 21,658		

Note: Table 2 indicates the number of landowners who own combined statewide acreages (more than one parcel) in the given size classes. For example, Table 1 indicates no single parcels exist in the 1,001 to 5,000 acre size class, Table 2 shows that several landowners own a combined acreage of disaggregate parcels that cumulatively add up to the 1,001 to 5,000 acre size class.

Comparison of Tabular Tax Parcel Data and Federal Information

Analysis of statewide tax parcel records revealed approximately 22,000 small forest landowners who represented over 1.6 million acres of forestlands enrolled in forest-use tax classifications. Because a significant number of forested parcels were classified under other land-use designations, the initial analysis of tax-classified forestlands was not able to identify all forested parcels ranging from 5-5,000 acres in size. Nor did the database identify any parcels less than 5 acres. Therefore, the Office looked to other sources of data in order to arrive at a better estimation of the total number of small forest landowners.

Federal estimates on small forest landowner acreage in the state (4.2 million acres), suggest that there are an additional 2.6 million acres not currently identified in forestland tax classifications. This amount divided by the median small forestland ownership size in the tabular dataset (35 acres) suggests that there may be approximately 74,000 additional

ownerships resulting in an estimated total of 96,000 small forest landowners with ownerships ranging from 1-5000 acres.

At this time it is still difficult to make any specific inferences about the actual number of small forestland acres statewide given the limitations of tax parcel information. Rural counties are extremely varied in ownership patterns, terrain and assessor's data recording methods. In order to achieve greater confidence in the actual number of small forest landowners, the number of parcels and total number of forested acres they manage, more powerful analytical tools such as a comprehensive statewide GIS database would need to be developed².

Contiguous Ownerships / Residency

Question:

Estimates of the number of parcels of non-industrial forests and woodlands held in contiguous ownerships of twenty acres or less, and the percentages of those parcels containing improvements used:

- (i) As primary residences for half or more of most years;*
- (ii) as vacation homes or other temporary residences for less than half of most years; and*
- (iii) for other uses.*

Contiguous Ownerships

It is not possible to answer the question of contiguous ownerships using tabular tax parcel information. To determine if two or more parcels are contiguous, each parcel must be geographically referenced to a high level of resolution. In the tabular database, the only geographic references are the legal descriptions (township, range, and section), which can only provide approximate locations of landownership. Therefore, since tabular information is the only data set available statewide, adjacency (contiguous ownership patterns) cannot be determined at this time.

Residency

While some counties record improvements on the land, the data that is necessary to provide residency information is only available from King and Clark County (Table 3 and Table 4). Therefore we cannot determine residency on a statewide basis with the current data from the rest of the counties.

² For a comparison of information generated from GIS digital orthophoto analysis and tabular tax parcel databases on four sampled counties, please contact the Small Forest Landowner Office.

Table 3. Clark County tabular tax parcel database residence information for forested parcels less than 20 acres.

RESIDENCE	# PARCELS	ACRES
Non Residence	660	4,347
Residence	398	3,405
Total	38% Residential	

No information on residency was supplied in the King County tabular tax parcel database. However, in the GIS tax parcel database, “assessed improvement value” can be assumed as a residence. It can not be determined if these improvements actually were primary residences or vacation homes. Using the assessed improvement value, according to the GIS database, 20% of King County small forested parcels 5-20 acres in size contain some type of improvement.

Table 4. King County GIS assessed improvement value information for parcels 5-20 acres in size.

	# OF PARCELS	ACRES
Total parcels 5-20 acres in size	770	7,517
Parcels 5-20 acres in size with assessed values greater than \$0	148	1,522

Watershed Administrative Units

Question:

The watershed administrative units in which significant portions of the riparian areas or total land area are non-industrial forests and woodlands.

Watershed Administrative Units

Identifying watersheds that have significant riparian or total small forest ownerships is difficult with tabular tax parcel data. The spatial information provided in the tabular data is based on legal descriptions; therefore the resolution of this information is limited to approximately one mile. Due to the poor resolution, it is difficult to tell what watershed(s) a parcel may be in if a parcel borders or intersects one or more watershed boundaries.

The term “significant portions” was not defined in the above question. [Appendix B](#) provides a chart listing those watersheds across the state that have greater than 20 percent ownership by small forest landowners. A list of all the watersheds containing small forestland ownerships is available from the Office. Due to the coarse nature of information from the counties tabular data, analysis of the watersheds can only reveal general trends in land ownership.

After analyzing GIS data from two counties that had GIS data available, and comparing the results to the tabular tax parcel data, it was interesting to note that, *in general*, the GIS and tabular data yielded similar results for small forest acreages in most watersheds. For reporting general statewide trends on watershed ownerships, the tabular data provides sufficiently accurate information. In order to determine the effects that forest management activities may have on specific watersheds and streams systems, however, analysis of spatially explicit GIS data will be necessary. Only King and Clark County had complete GIS data, therefore [Appendix C](#) provides charts showing the percent of the total watershed in small forest ownership in each watershed in these two counties. These charts also show comparisons between the results of tabular data analysis and GIS data analysis.

Small Forest Ownerships in Riparian Areas

Given that tabular tax parcel data can only provide geographically accurate information down to one mile, GIS data had to be utilized to accurately analyze proximal locations to riparian areas. Only two Westside counties, King and Clark, had comprehensive GIS data on their stream systems. A 100-foot buffer surrounding all water types was overlaid on the GIS parcel map and a query was made of all acres of small forestlands that occurred within the width of that buffer. [Appendix D](#) provides charts showing the percent of small forest ownerships within 100 feet of any typed water within the watersheds of the two Westside sample counties.

Trends in Forest Practices Applications

Question:

[Provide] estimates of the number of forest practices applications and notifications filed per year for forest road construction, silvicultural activities to enhance timber growth, timber harvest not associated with conversion to non-forest land uses, with estimates of the number of acres of non-industrial forests and woodlands on which forest practices are conducted under those applications and notifications.

To date, forest practices application information has not been collected in a manner that would allow for segregating out the kinds of information needed to quantifiably answer this question. A new system, Forest Practices Application Reporting System (FPARS), has recently been established that should enable the Office to answer this question in future reports.

Recommendations for More Effective Incentives

Question:

[Provide] Recommendations on ways the board and the legislature could provide more effective incentives to encourage continued management of non-industrial forests and woodlands for forestry uses in ways that better protect salmon, other fish and wildlife, water quality, and other environmental values.

Note: The Small Forest Landowner Office can provide additional background information on any of the following recommendations.

Forestry Riparian Easement Program

Continued financial support for the Forestry Riparian Easement Program is recommended. It is estimated that for the 2003-2005 biennium, a sum of at least \$5 million dollars could easily be distributed to interested small forest landowners by the program.

Other recommended improvements/changes to the Forestry Riparian Easement Program that are being reviewed by the Office include:

- ◆ Streamlining the process (currently, easements take six months to one year to complete);
- ◆ Revising the easement timber valuation methods to reflect compensation for stumpage values as opposed to the current process based on taxing stumpage values.
- ◆ Utilizing other legal strategies to protect qualifying timber during the term of the easement without unduly encumbering property values.

Alternate Plans

A viable alternate planning process for small forest landowners is essential to the successful implementation of the Forests and Fish rule package. Central to the success of the alternate planning process is the ability of the Office to provide sufficient staff and technical assistance to small forest landowners. Success also depends on the commitment of all involved state agencies to the process. Small forest landowners statewide have also expressed the need for longer-term forest practices permits (i.e. 10-15 years) that more adequately address the timeline of their management activities. The Office recommends that the alternate planning process serve as the appropriate mechanism through which landowners can submit for a longer-term permit.

Other recommended improvements/changes to the alternate planning process that are being reviewed by the Office include:

- ◆ Developing management templates for specific scenarios that commonly occur on small forestlands. Management templates will aid landowners in developing appropriate plans and will simplify and expedite both interdisciplinary team reviews and the approval process.
- ◆ Development of a monitoring process that will include cumulative effects analysis at the watershed or sub-basin scale.

Small Forest Landowner Database

A spatially explicit GIS database can provide policy makers a powerful tool for weighing future decisions on how forest management regulations can best balance public resource protection goals with maintaining a viable small-scale forest industry in Washington State. A spatially explicit GIS database can also provide the necessary information for further developing alternate planning processes for small forest landowners. Expanding the geographically spatial scope of the database will allow analysis of stream and riparian ownerships, contiguous ownerships of small forestlands, and ownership patterns at the watershed level. Information from this database will also be useful to other state and federal natural resource agencies (i.e. implementing culvert replacement strategies for Road Maintenance and Abandonment Plans) as future policies are developed that affect forest management in Washington State.

Educational Outreach

A recent statewide survey conducted by the Small Forest Landowner Office revealed that less than 30 percent of family forest landowners are familiar with the Forests and Fish rules and less than 25 percent are familiar with the Road Maintenance and Abandonment Plan requirements of the new rules. Additionally, staff attendance at regional conferences on salmonid recovery and natural resource management has revealed that the role small forest landowners play in protecting public resources is not well understood by the public. Goals of the Small Forest Landowner Office are to conduct comprehensive statewide public outreach to family forest owners to inform them of their obligations under the state forest practices rules as well as provide information on funding and technical assistance programs available to help them improve the management of their forestlands. Additionally, the Office plans to directly participate in future natural resource management conferences in an effort to inform policy makers and the general public of the important role family forests play in protecting natural resources. Continued support in these outreach efforts is recommended.

Grant funds manager

Through an extensive research effort to identify all state and federal sources of funding that could be used to assist small forest landowners improve the management of their forest lands, over 25 programs totaling more than \$16 million in potential annual funding sources were identified. In order to systematically apply for and develop mechanisms through which to deliver this funding to small forest landowners, a full time grant funds

manager within the Small Forest Landowner Office will be needed. The grant funds manager would continue to research funding sources, submit funding proposals to appropriate sources and develop a cost-sharing program within DNR to serve as a pass-through program to provide financial aid to small forest landowners.

Programmatic Habitat Conservation Plan for Family Forests

The Small Forest Landowner Office is providing technical and staff assistance towards the development of a programmatic habitat conservation plan for Lewis County small forest landowners. The *Family Forest Habitat Conservation Plan* (FFHCP) is being developed as a voluntary process for small forest landowners to create scientifically based long-term management options. The FFHCP is designed as a programmatic habitat conservation plan (HCP) for upland and aquatic species. A HCP approach to land management provides a solution to the financial and technical challenges currently facing small forest landowners. The plan would substitute for applicable sections of the Forest Practices Rule package and serve as the conditions under which participating landowners would operate. The Office recommends continuing support for this pilot project.

Small Forestry Business Development

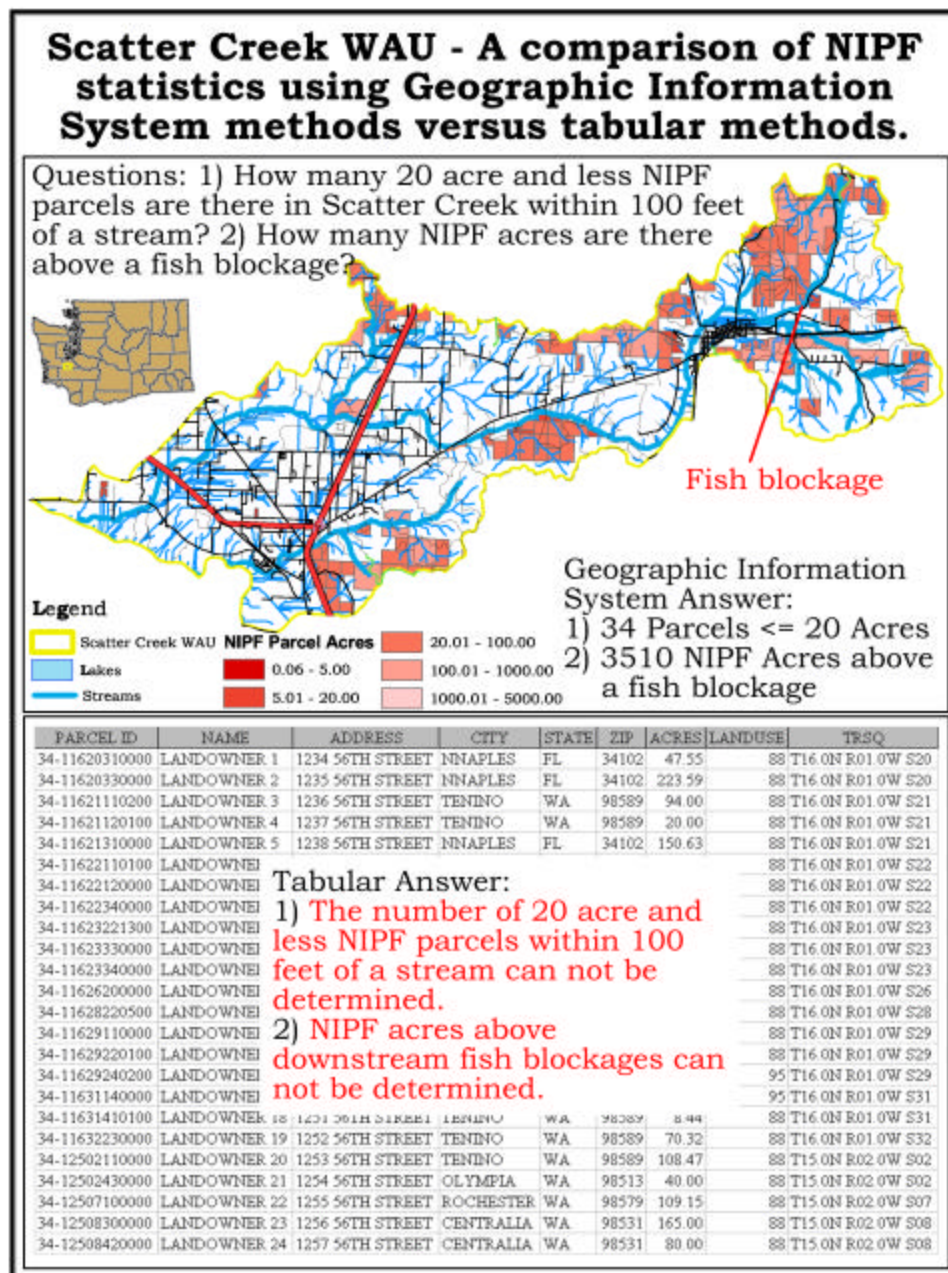
If public benefits provided by family forests are to be maintained without perpetual government financial subsidies, public assistance should be directed to programs that promote the economic viability and ultimately the economic independence of small-scale forestry operations. When forest management becomes economically competitive with conversion to development, the ecological values provided by family forests will be in a better position to be conserved. Additionally, economic independence of landowners can enable ongoing stewardship of their forest resources. Promoting innovative business models, such as small forest landowner cooperatives, will encourage landowners to work together to achieve higher standards of forest management. Developing markets for family forest grown timber products will also allow consumers and the general public to become direct participants in the conservation of family forests. The Office recommends that support be provided for promoting forestry cooperatives and other innovative business models.

Appendix A

Comparison of Geographic Information System (GIS) data and tabular tax parcel data when trying to answer spatially explicit questions.

The following image shows the limitations of tabular tax parcel data when trying to answer spatially explicit questions. Although tabular information is spatially explicit, it is based on legal descriptions (township, section, range), and therefore has a resolution of one mile. GIS data, however, is accurate down to approximately 15 feet depending on how the data was collected. Therefore, GIS data is much more capable of answering questions that require spatially precise information.

Figure 1. A comparison of non-industrial private forestland statistics using geographic information system tax parcel record methods versus tabular tax parcel record methods.



Appendix B

Statewide small forest ownerships by watershed administrative unit (WAU)

(data generated from the tabular tax parcel database)

Table 5. Statewide non-industrial private forest and woodlands (small forest landowners (SFL)) by watershed administrative unit.

WAU	WRIA	SFL ACRES	WAU ACRES	PERCENT SFL
GROUSE CREEK	COLVILLE	11,708	22,478	52%
HUCKLEBERRY CREEK	COLVILLE	25,454	49,598	51%
MAGEE CREEK	MIDDLE LK ROOSEVELT	24,266	47,322	51%
MF NEWAUKUM	UPPER CHEHALIS	13,839	28,292	49%
ECHO	COLVILLE	16,930	37,562	45%
MIDDLE COLVILLE	COLVILLE	18,575	41,619	45%
LOON-DEER LAKES	COLVILLE	22,263	50,582	44%
EAST STRANGER CRE	COLVILLE	12,706	29,341	43%
HARVEY CREEK	MIDDLE LK ROOSEVELT	18,865	45,851	41%
HAZELDELL	COWLITZ	4,506	10,972	41%
MILL CREEK	COWLITZ	11,512	28,095	41%
DEER VALLEY	PEND OREILLE	13,732	33,763	41%
LONG LAKE NORTH	LOWER SPOKANE	12,303	30,694	40%
QUILLISACUT CREEK	MIDDLE LK ROOSEVELT	9,505	23,782	40%
KELLY HILL	UPPER LK ROOSEVELT	7,481	19,121	39%
HUNTERS-ALDER	MIDDLE LK ROOSEVELT	18,641	47,824	39%
HALLER CREEK	COLVILLE	25,158	64,957	39%
OLEQUA	COWLITZ	13,507	35,481	38%
STENSGAR CREEK	COLVILLE	17,778	46,702	38%
OR-A-PAK-EN CREEK	MIDDLE LK ROOSEVELT	14,540	39,275	37%
FORD	LOWER SPOKANE	22,877	63,776	36%
SCATTER CREEK	UPPER CHEHALIS	11,930	33,928	35%
BRUCE CREEK	UPPER LK ROOSEVELT	17,879	52,739	34%
LANNIGAN SPRINGS	UPPER YAKIMA	3,258	9,933	33%
ONION CREEK	UPPER LK ROOSEVELT	15,505	47,360	33%
LACAMAS	COWLITZ	17,861	55,056	32%
LOWER NF NEWAUKUM	UPPER CHEHALIS	13,470	41,531	32%
BEAVER CREEK	LITTLE SPOKANE	15,040	46,410	32%
THOMPSON CREEK	MIDDLE SPOKANE	9,219	29,896	31%
SCAMMON-STEARNES	UPPER CHEHALIS	13,857	45,343	31%
HARMONY	COWLITZ	6,530	21,973	30%
COTTONWOOD CREEK	COLVILLE	9,245	31,939	29%
VEDDER	NOOKSACK	6,173	21,376	29%

WAU	WRIA	SFL ACRES	WAU ACRES	PERCENT SFL
WEST BRANCH	LITTLE SPOKANE	18,297	65,154	28%
NORTHPORT	UPPER LK ROOSEVELT	11,496	41,530	28%
COAL CREEK	GRAYS-ELOKOMAN	6,419	23,724	27%
GEORGE CREEK	MIDDLE SNAKE	5,749	21,895	26%
CAMAS VALLEY	LOWER SPOKANE	15,164	57,779	26%
CEDAR CREEK	LEWIS	9,585	36,677	26%
BLAKELY	SAN JUAN	3,461	13,274	26%
LOWER WILLAPA	WILLAPA	9,853	37,953	26%
JORDAN	STILLAGUAMISH	3,911	15,311	26%
CURTIS	UPPER CHEHALIS	11,025	44,976	25%
BLACK RIVER	UPPER CHEHALIS	16,164	66,500	24%
ROCK-JONES	UPPER CHEHALIS	6,818	28,098	24%
UPPER SOUTH FORK	UPPER CHEHALIS	5,906	25,173	23%
EBEY HILL	STILLAGUAMISH	4,344	18,588	23%
DEER CREEK	COLVILLE	6,683	28,786	23%
SCOTIA	LITTLE SPOKANE	21,112	91,623	23%
MAIN TOUTLE	COWLITZ	8,860	39,748	22%
LITTLE QUIL	QUILCENE-SNOW	6,334	28,616	22%
BLANCHARD CREEK	MIDDLE SPOKANE	9,165	41,957	22%
HUFFAKER	COWLITZ	3,721	17,471	21%
DEMING	NOOKSACK	5,882	27,663	21%
DRAGOON CREEK	LITTLE SPOKANE	13,011	61,562	21%
CURLEW CREEK	KETTLE	2,968	14,061	21%
MILLER CREEK	UPPER SKAGIT	2,139	10,195	21%
MOX CHEHALIS	LOWER CHEHALIS	4,034	19,279	21%
HEADWATERS	WILLAPA	13,147	62,909	21%
PIERRE	KETTLE	5,732	27,533	21%
TOULOU CREEK	KETTLE	10,018	48,401	21%
KOSMOS	COWLITZ	3,732	18,044	21%
LOWER KALAMA	LEWIS	9,495	46,324	20%
ABERDEEN WATERSHE	LOWER CHEHALIS	4,995	24,378	20%
DEER CREEK	LITTLE SPOKANE	9,311	45,460	20%
WOODS CREEK	SNOHOMISH	8,784	43,009	20%
LOWER COWEEMAN	COWLITZ	9,050	45,054	20%
BREMER	COWLITZ	4,345	22,001	20%
LOWER SKOKOMISH	SKOKOMISH-DOSEWALLIPS	4,092	20,747	20%

Appendix C

Non-industrial private forestlands by watershed administrative unit (WAU) in Clark and King County

Clark County

Table 6. Non-industrial private forestlands by WAU in Clark County. WAUs that are not listed have no non-industrial private forest riparian ownership.

WAU	% SMALL FORESTLAND (TABULAR)	% SMALL FORESTLAND (GIS)	WAU ACRES
CANYON CREEK	2%	1%	42,851
CATHLAPOTL	6%	13%	36,677
CEDAR CREEK	52%	19%	21,377
COPPER CREEK	1%	0%	30,691
HORSESHOE FALLS	13%	16%	42,701
LACAMAS	24%	7%	14,829
LAKE MERWIN	5%	4%	34,442
LITTLE WASHOUGAL	6%	7%	22,755
MT ZION	3%	3%	21,482
ROCK CREEK	7%	7%	28,416
SILVERSTAR	1%	1%	40,447
VANCOUVER	5%	4%	125,008
WOODLAND	4%	3%	39,753
YACOLT	15%	12%	54,996
TOTAL ACRES	45,692	35,099	

King County

Table 7. Non-industrial private forestland by WAU in King County. Those WAUs that are not listed have no non-industrial private forest riparian ownership.

WAU	% SMALL FORESTLAND (TABULAR)	% SMALL FORESTLAND (GIS)	WAU ACRES
BARING	1.81%	1.82%	36,341
BECKLER RIVER	0.15%	0.01%	65,853
CEDAR, LOWER	1.52%	1.09%	19,526
CHERRY	4.33%	3.49%	45,157
CHESTER	0.00%	0.00%	52,064
CUMBERLAND	19.47%	12.17%	19,101
DECEPTION	0.48%	0.47%	51,911
FOSS RIVER	0.16%	0.17%	40,183

GREEN	0.00%	0.00%	23,675
GREEN, NF	4.90%	3.62%	22,602
GREEN-DUWAMISH, LOWER	2.99%	1.86%	123,693
GREENWATER	0.00%	0.00%	49,240
GRIFFIN	2.14%	1.74%	20,024
HAYSTACK	0.00%	0.00%	24,190
HOWARD HANSEN	1.10%	0.47%	46,528
LAKE SAMMAMISH	0.17%	0.03%	23,597
LAKE WASHINGTON, N	0.20%	0.12%	142,906
LAKE WASHINGTON, S	0.72%	0.62%	77,192
LANDSBURG	0.81%	0.00%	22,936
LESTER	0.00%	0.00%	32,833
LOWLAND WHITE	0.30%	0.11%	46,636
MIDDLE, LOWER	9.51%	6.79%	24,249
MIDDLE, UPPER	1.22%	0.63%	85,536
MILLER-MONEY	0.10%	0.10%	39,672
MUD MTN	1.75%	1.41%	33,822
NEWAUKUM	8.48%	4.81%	24,845
PUGET	0.02%	0.02%	109,241
PUYALLUP, LOWER	0.00%	0.00%	87,939
RAGING RIVER	3.47%	2.40%	22,460
SMAY	0.00%	0.00%	14,496
SNOQUALMIE, LOWER	9.63%	7.90%	35,125
SNOQUALMIE, NF	2.81%	2.50%	65,963
SNOQUALMIE, S	1.81%	1.47%	55,194
SUNDAY	0.00%	0.00%	15,598
TATE	10.60%	6.58%	10,694
TIGER	3.10%	2.10%	40,786
TOKUL	2.29%	0.93%	21,398
TOLT	1.91%	1.31%	63,462
VASHON IS	3.34%	3.23%	49,866
WHITE, MIDDLE	0.00%	0.00%	28,678
YOUNGS CREEK	0.00%	0.00%	18,678

Appendix D

Percent of riparian land base in non-industrial private forest ownerships by watershed in Clark and King County

Clark County

Table 8. Percent of riparian land base (100 ft. buffer) in non-industrial private forest ownerships by WAU using Clark County GIS data. WAUs that are not listed have no non-industrial private forest riparian ownerships.

WAU	100 FT
CANYON CREEK	1.20%
CATHLAPOTL	12.67%
CEDAR CREEK	20.03%
COPPER CREEK	0.70%
HORSESHOE FALLS	16.03%
LACAMAS	8%
LAKE MERWIN	3.81%
LITTLE WASHOUGAL	6.21%
MT ZION	3.72%
ROCK CREEK	8.54%
SILVERSTAR	1.70%
VANCOUVER	5.86%
WOODLAND	5.14%
YACOLT	10.24%

King County

Table 9. Percent of riparian land base (100 ft. buffer) in non-industrial private forest ownerships by WAU using King County GIS data. Those WAUs that are not listed have no non-industrial private forest riparian ownerships.

WAU	100 FT
BARING	1.16%
CEDAR, LOWER	0.22%
CHERRY	3.92%
CUMBERLAND	7.81%
DECEPTION	0.66%
GREEN, NF	1.12%
GREEN-DUWAMISH, LOWER	1.85%
GRIFFIN	2.34%
HOWARD HANSEN	0.25%

LAKE SAMMAMISH	0.14%
LAKE WASHINGTON, N	0.09%
LAKE WASHINGTON, S	0.83%
LOWLAND WHITE	0.01%
MIDDLE, LOWER	5.59%
MIDDLE, UPPER	1.16%
MILLER-MONEY	0.01%
MUD MTN	0.60%
NEWAUKUM	4.25%
RAGING RIVER	1.24%
SNOQUALMIE, LOWER	7.39%
SNOQUALMIE, NF	1.66%
SNOQUALMIE, S	1.58%
TATE	7.19%
TIGER	2.06%
TOKUL	0.86%
TOLT	1.28%
VASHON IS	7.30%